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3,449,706

PROTECTIVE ENCLOSURE FOR ELECTRICAL WIRING DEVICES

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Fig. 1

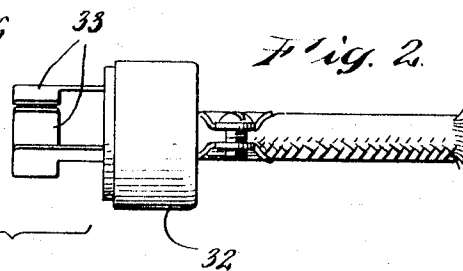
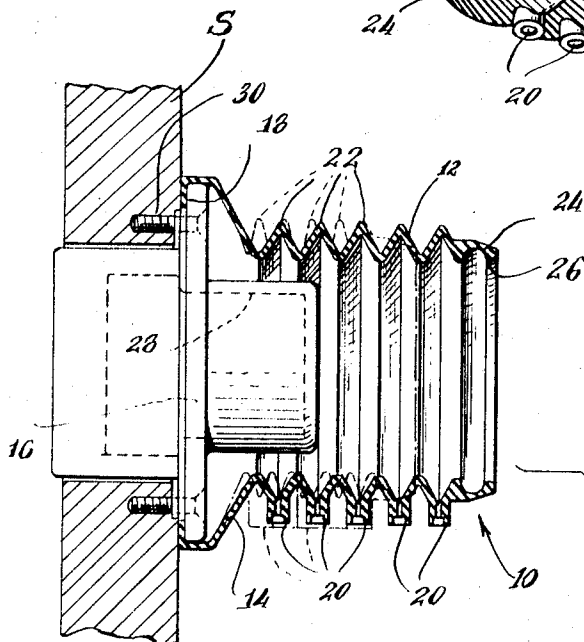
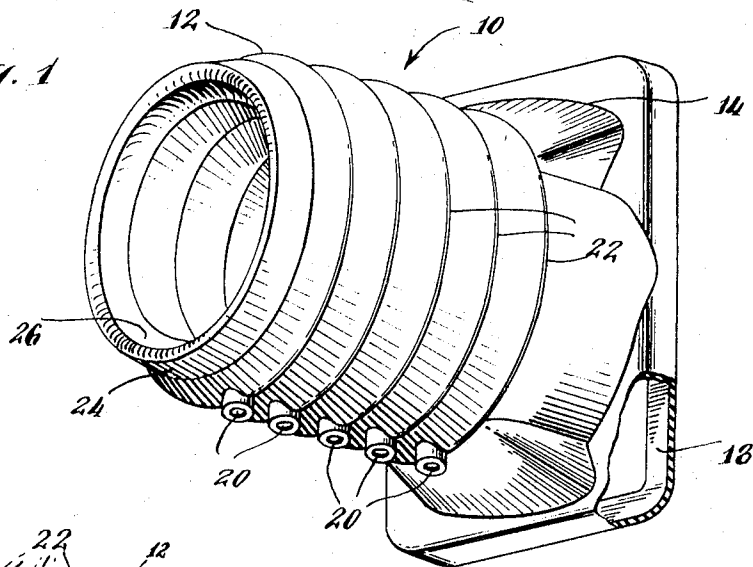


Fig. 2

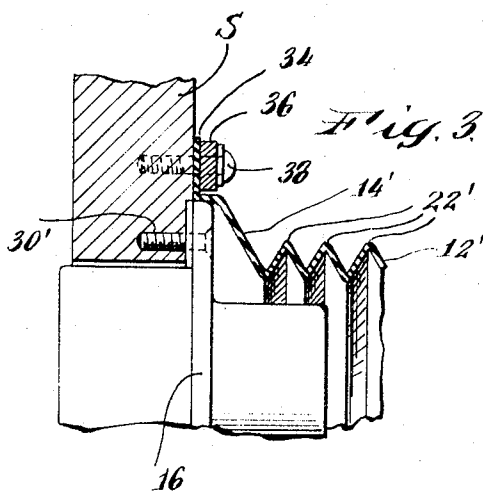


Fig. 3

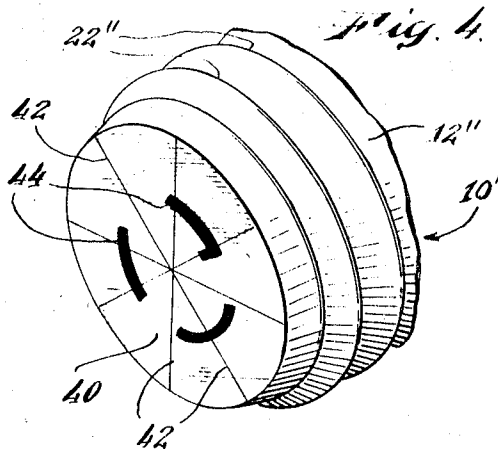


Fig. 4

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PROTECTIVE ENCLOSURE FOR ELECTRICAL WIRING DEVICES

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8 Claims

ABSTRACT OF THE DISCLOSURE

A protective enclosure, for an electrical receptacle, having a rear portion securable to a supporting surface and formed to house an electrical receptacle and receptacle face plate and a forward axially deformable bellows portion normally extending beyond the forward face of the receptacle.

Background of the invention

My invention relates to a protective enclosure for electrical wiring devices and more particularly an enclosure in the form of a resilient bellows for use in outdoor applications.

Electrical receptacles, which are power outlets or inlets fixed to a supporting means, are often used in outdoor applications and when used in these locations it has been the practice to shield the receptacle from rain by suitable spring biased lift covers. These lift covers are spring loaded flaps, usually gasketed, which overlie the face of the electrical receptacle when it is not in use and which must be lifted to a substantially horizontal position for insertion of an electrical plug. When the plug is withdrawn, they return to their closed position under the influence of the biasing spring. These lift covers are used primarily to protect the receptacle contacts when the receptacle is not in use and have only limited value to protect the coupled plug and receptacle from rain, affording fairly adequate shielding to the mating electrical devices in a direct downward rain. In a driving or slanting rain, however, the known lift covers offer little protection.

Furthermore, lift covers of this type are subject to various types of failure. The most common cause of deterioration is corrosion which attacks lift covers made of materials other than highly corrosion-resistant materials, which are very expensive. The corrosion-resistant plastic materials are subject to breakage from the rough usage to which they are exposed. The springs which provide the closing biasing force are exposed to the corrosive elements and the trunnions upon which the lift cover is mounted are also subject to corrosion and fouling which impede the closing of the cover. This known construction is relatively expensive to manufacture as well as to assemble since it is composed of a plurality of parts.

Summary of the invention

Therefore, the primary objects of my invention are to provide a one piece molded protective housing which is inexpensive to manufacture and install and which offers maximum environmental protection to an outdoor mounted receptacle both when not in use and when coupled with a plug.

To accomplish these objects in one form, I have provided a protective enclosure, for housing an electrical receptacle and receptacle face plate, which may be secured to a suitable supporting surface, the enclosure comprising an elongated substantially tubular member having a forward axially deformable portion formed of a resilient material, a rear portion for receiving the receptacle face

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plate and a mounting portion adjacent the rear portion and remote from the forward portion for securing the enclosure upon the supporting surface.

Brief description of the drawings

Other objects and further details of that which I consider to be novel and my invention will be clear from the following description and claims taken with the accompanying drawings wherein:

FIG. 1 is a perspective view of the protective enclosure constructed in accordance with my invention partially broken away to show the mounting means;

FIG. 2 is a side elevational view of the protective enclosure shown mounted upon a supporting surface and housing an electrical receptacle and an electrical plug aligned to be interconnected with the receptacle, and showing in dot-dash lines the location of the bellows when the plug is being mated with the receptacle;

FIG. 3 is a vertical sectional view taken through a modified form of my protective enclosure; and

FIG. 4 is a partial perspective view of another embodiment of my protective enclosure.

Description of the preferred embodiments

With reference to the drawing there is illustrated a molded protective enclosure 10 made of a resilient material such as a rubber compound, polyvinyl chloride or other suitable material. The enclosure includes a forward bellows portion 12 which may be substantially circular as shown or may be of any desired cross-section, and a rear, enlarged, housing portion 14 which also may take any suitable form for housing a receptacle face plate 16. The housing portion 14 terminates in a mounting portion which comprises an inwardly extending peripheral mounting flange 18. Axially aligned weep holes 20 may be formed through exterior folds 22 of the bellows 12 to insure adequate drainage from the interior of the enclosure. The bellows portion 12 is open at its forward end and includes a radially inwardly extending taper 24 terminating in a bead 26.

As can be seen in FIG. 2 the housing portion 14 of the enclosure 10 houses the receptacle face plate 16 and a portion of an outlet 28. The mounting flange 18 is interposed between the supporting surface S and the face plate 16 which plate is secured to the surface S by means of the usual plate mounting screws 30. Therefore, the imprisoned mounting flange 18 provides both mechanical securing of the enclosure 10 upon the surface S and a watertight gasketed joint between the supporting surface S and the receptacle face plate 16. When the enclosure 10 is correctly mounted over the receptacle, the weep holes 20 should be positioned on a line defined along the bottom of the bellows portion 12.

When the receptacle is not in use the bellows portion 12 normally extends axially beyond the forward face of the receptacle to protect it. The bellows portion is formed long enough to protect the receptacle against rainfall in substantially all directions when not in use. Of course, if the wind drives the rain horizontally the receptacle will not be protected, however, the shielding effect may be increased by mounting the bellows at an angle inclined downwardly from the horizontal. Furthermore, the bellows allows the user to compress this portion to greatly reduce its effective length as shown in dot-dash lines in FIG. 2. Thus, when the user wishes to insert the plug 32 having blades 33 into the receptacle, the bellows portion 12 is compressed to substantially expose the forward face thereof to align the blades with the corresponding receptacle slots (not shown) for easy coupling. Once the plug 32 and outlet 28 are securely coupled, the bellows portion 12 is released and it returns to its extended position to

house both electrical connector devices to offer maximum protection from the elements.

FIGS. 3 and 4 illustrate modifier forms of my novel protective enclosure wherein similar elements of the FIG. 3 embodiment have been given similar numerals with a prime (') added and similar elements of FIG. 4 are given similar numerals with a double prime (") added.

I have disclosed in FIG. 3 a modified form of my novel protective enclosure in which the mounting means includes an outwardly extending peripheral mounting flange 34 upon which a picture frame type of mounting cover 36 may be used to secure the enclosure to the supporting surface S. In this form the cover 36 which is secured to the surface S by means of cover securing screws 38 urges the flange 34 against the surface S for mounting the enclosure thereupon and for gasketing the joint.

FIG. 4 is illustrative of another modification of my invention in which the bellows portion 12" of the enclosure 10" is provided with a substantially closed end 40 having a plurality of radial slits 42 therein and having markings 44 thereon to indicate the orientation of the receptacle slots. In use the bellows portion 12" is compressed, the blades of the plug are oriented with respect to the receptacle slots by means of the markings 44, the plug is inserted into the enclosure and is rotated to be coupled with the receptacle and the bellows is released. The bellows will return to its extended position and the slit end 40 will "close" upon the conductor cable, to completely enclose the plug. This embodiment affords almost total rain protection to the receptacle when not in use and to both electrical devices when coupled.

Having described my invention of an improved protective enclosure particularly useful for use with outdoor mounted electrical receptacles, it will be readily appreciated by those skilled in this art that an enclosure embodying my invention is simple in design, low in cost, and ingenious in operation. It should be readily seen that this type of novel protective enclosure offers rain protection to electrical receptacles both with and without a plug installed. The bellows portion can be compressed during plug insertion to aid the user in observing the face of the receptacle for properly receiving the plug, restores to its extended condition automatically, provides its own sealing gasket and, being made of resilient material, is not subject to breakage. The absence of springs under load insures reliability of operation and the combination of the enclosure and receptacle face plate is more economical than the lift cover assemblies heretofore employed.

It should be understood that the present disclosure has been made only by way of example and that numerous changes in details of construction and the combination and arrangement of parts may be resorted to without departing from the true spirit and the scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A protective enclosure for shielding the front face of an electrical receptacle having a face plate, comprising an elongated substantially tubular member including a

forward axially deformable portion formed of a resilient material which is normally extended to shield the front face of the electrical receptacle and to shield the coupled electrical connector when a connector device is mated with the receptacle, said enclosure having a receptacle face plate receiving rear portion and a mounting portion extending transversely from the periphery of said rear portion and remote from said forward portion for securing said enclosure upon a supporting surface.

2. The protective enclosure defined in claim 1 wherein said forward axially deformable portion comprises a bellows having an open forward end and normally extending beyond the forward face of a receptacle which is shielded thereby.

3. The protective enclosure defined in claim 2 wherein a plurality of axially aligned weep holes are defined in the exterior folds of said bellows.

4. The protective enclosure defined in claim 1 wherein said mounting portion comprises a peripheral inwardly extending mounting flange arranged to be interposed between the receptacle face plate and the supporting surface.

5. The protective enclosure defined in claim 4 wherein said mounting flange is formed of a resilient material for providing a gasketed joint as well as a mechanical securing means.

6. The protective enclosure defined in claim 1 wherein: said forward axially deformable portion comprises a bellows having an open forward end and including a plurality of axially aligned weep holes defined in the exterior folds thereof; and said mounting portion comprises a peripheral inwardly extending mounting flange arranged to be interposed between the receptacle face plate and the supporting surface, said enclosure being molded of a resilient material in one piece.

7. The protective enclosure defined in claim 1 wherein said mounting portion comprises a peripheral outwardly extending flange.

8. The protective enclosure defined in claim 1 wherein said forward axially deformable portion comprises a bellows having a substantially closed forward end defining plural radial slits therein and including plural markings thereon positioned to indicate the orientation of the housed receptacle slots.

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